Selection Statement

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Selection Statement

Selection is a very useful technique, allowing data items to be picked out according to given criteria.

Question: What is selection?

- Testing a condition to determine the sequence of execution

- IF .... THEN.... ELSE..... ENDIF
- CASE ....OF.....OTHERWISE....ENDCASE.

Q1: Write a pseudocode of a program in which input two numbers and print the largest number.

```
DECLARE N1,N2 : INTEGER
IF N1 > N2
    THEN
        Print "The largest number is", N1
    Else
        Print "The largest number is", N2
ENDIF
```

THEY SHOULD SOLVE THIS.

Question : Write pseudocode of a program in which input two numbers and print the smallest number.

OPERATORS IN SELECTION STATEMENT

AND

OR

Condition AND Condition

Both the condition should be True

Condition OR CONDITION.

Any one condition could be true.

Question : Write a pseudocode of a program in which input three numbers and print the largest number.

```
DECLARE N1, N2, N3 : INTEGER

INPUT N1, N2, N3
IF (N1 > N2) AND (N1 > N3)
```

```
IF (N1 > N2) AND (N1 > N3)
    THEN
        PRINT "The largest number is :", N1
    ELSEIF (N2 > N1) AND (N2 > N3)
        THEN
            PRINT "The largest number is :", N2
                ELSE
                    PRINT "The largest number is :", N3
    ENDIF
ENDIF
```

Question: The format for the password is, it should contain 9 characters. Write pseudocode of program in which input a password and print "approve" if it contains 9 character and print "Re-write your password" if not?

```
DECLARE Pass : STRING
DECLARE characters : INTEGER

PRINT "ENTER YOUR PASSWORD"
INPUT Pass
characters = LENGTH (Pass)
IF characters : 9
    THEN
        PRINT "Approve"
    ELSE
        PRINT "Re-write your password"
```

```
    ELSE
        PRINT "Re-write your password"
ENDIF
```

Question : The first digit of the password should be capital letter.
· Write pseudocode of program in which input a password and print "approve" if first letter is Capital and print "Re-write your password" if not?

```
DECLARE Pass : String
DECLARE First Character : String

· PRINT "ENTER YOUR PASSWORD"
INPUT Pass
First Character = LEFT(Pass, 1)
IF First character >= A AND First character <= Z
    THEN
        PRINT "Aprrove"
    ELSE
        PRINT "Re-write your password"
ENDIF
```

Note : If you want to check that the characters are digits you could use ISNUM(□) function to do that.

ISNUM(123) => True
↳ string value

THEY SHOULD SOLVE THIS.

Question : . First digit should be capital
. 2nd, 3rd, 4th digit should be numbers.
. Length of the password should be 9 characters.

Write a pseudocode of a program in which input the password and print "Approve if these conditions are correct and print "Rewrite password" if not.

TYPE 2 : CASE ... OF ... OTHERWISE ..... ENDCASE.

We use type 2 when there are alot choices.

Question : Write a pseudocode of a program in which input a number and and print positive if it is positive integer and print negative if negative integer and print zero if zero.

DECLARE NUMBER : INTEGER

INPUT Number

CASE Number OF

> 0 : Print "positive"

< 0 : Print "Negative"

= 0 : Print "Zero"

Otherwise

Print : "Wrong Input"

ENDCASE

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2 The following is a function design in pseudocode.

Line numbers are given for reference only.

```
01  FUNCTION GradeCalc(Mark : ARRAY[] OF INTEGER) RETURNS INTEGER
02
03    DECLARE DGradeCount : INTEGER
04    DECLARE n : INTEGER
05    DECLARE Grade : STRING
06    DECLARE ThisMark : INTEGER
07
08    DGradeCount ← 0    // initialise variables
09    n ← 1
10    ThisMark ← 1
11    REPEAT
12       ThisMark ← Mark[n]    // get next mark from Mark array
13
14       IF ThisMark > 74
15          THEN
16             Grade ← "Distinction"
17             DGradeCount ← DGradeCount + 1 // one more Distinction
18          ELSE
19             IF ThisMark > 59
20                THEN
21                   Grade ← "Merit"
22                ELSE
23                   IF ThisMark > 39
24                      THEN
25                         Grade ← "Pass"
26                      ELSE
27                         Grade ← "Fail"
28                   ENDIF
29             ENDIF
30       ENDIF
31
32       OUTPUT "Grade for Student " & n & " is " & Grade
33
34       n ← n + 1
35    UNTIL n = 101 // no more elements in the array
36
37    RETURN Grade // return the number of Distinction grades
38
39  ENDFUNCTION
40
41  DECLARE Mark : ARRAY[1:100] OF INTEGER
42  DECLARE DistinctionGrades : INTEGER
43
44  CALL GetMarks(Mark[])  // fill the array with student marks
45  DistinctionGrades ← GradeCalc(Mark[])
```

(a) This pseudocode includes features that are examples of good practice.

Explain why it is useful to include the two following features.

Comments Easier for other people to understand

Easier to maintain.

Indentation Identify blocks of code.

[2]

(ii) Lines 14 to 30 of the pseudocode on page 4 could be written using a `CASE` structure.

Write the equivalent `CASE` structure in **pseudocode**.

```
Case ThisMark OF
        >74 : Grade = "Distinction"
              DgradeCount = DgradeCount + 1
60 to 74 : Grade = "Merit"
40 to 59 : Grade = "Pass"
        Otherwise
              grade = "Fail"
Endcase
```

[4]

(c) **(i)** There is a mistake in the pseudocode that would produce a data type mismatch error if a programmer were to write similar program code.

Describe this mistake and how it may be corrected.

Line 32 (concatenation

Line 37 returns string should return integer

[2]